

Recessions of 1939-1945: agricultural cycles in a wartime economy

Recession | PEAK: 1939 - TROUGH: 1940.

Recession | PEAK: 1944 - TROUGH: 1945.

The volatility of agricultural cycles, the dynamics of the wartime economy (including rationing and obstacles to international trade), and Portugal's neutrality in the conflict made this period unique compared to other countries at the time, or other periods in Portuguese economic history. The onset of World War II coincided with a poor agricultural year in 1939-40. Afterwards, the country experienced strong growth during the conflict, with a real GDP expansion somewhere between 19% and 30% in the period from 1940 to 1944, partly due to exports to the warring powers, especially of tungsten, which resulted in a historic trade surplus in 1942. International pressure led to the termination of tungsten exports in 1944, which, combined with the longest recorded drought in mainland Portugal (between 1943 and 1946), contributed to a recession in 1944-45.

1. INTERNAL AND EXTERNAL CONTEXT

The period from 1939 to 1945 was marked by World War II and its impact on the global economy. Portugal remained neutral in the military conflict, despite several attacks on Portuguese vessels in the Atlantic and the occupation of Timor (first by the Allies and then by the Axis). The country kept trade relations with both sides of the conflict, but disruptions to international trade and shortages of goods were keenly felt, although to a lesser extent than in World War I.

In terms of direct trade relations with the belligerents, a notable agreement was reached in July 1940 between Banco de Portugal and the Bank of England, with Portugal providing unlimited credit and a grace period until the end of the conflict for British purchases of Portuguese goods. The balance of that credit account amounted to around 80 million pounds sterling in 1945. Tungsten (or wolfram) exports were also significant, but in June 1944, under diplomatic pressure, Portugal completely ceased the (official) export of this mineral to both sides.

Monetary policy targeted a fixed exchange rate against the dollar (1 dollar per 25 escudos), and prices were stable before the war. Following the guidelines of the gold standard, following what was happening in the United States, monetary policy between 1939 and 1945 was expansionary: the money supply in circulation grew by 300%, and Banco de Portugal's discount rate continuously dropped from 4% to 2% (the lowest value of the century). Inflation was high, resulting in negative real interest rates throughout the period, but bank deposits grew in line with the money supply. At the end of the conflict, deposits in the national banking system significantly decreased, and there was a fear of a deflationary shock causing a recession. Banco de Portugal

responded by reducing the gold or foreign exchange coverage of banknote issuance from 100% to 50% and implementing other restrictive policies to control inflation (Amaral, 2018). Unlike what had happened in World War I, prices returned to pre-war stable levels, especially after 1947.

Fiscal policy maintained its previous goal of balancing public accounts. However, this was put to the test during this period, with the public deficit reaching 1.4% of GDP in 1945, the highest deficit of the Estado Novo regime. On the expenditure side, real military spending increased by 60% during the conflict (Silva Lopes, 2005), as a result of sending military contingents to Cape Verde, the Azores, and Madeira. On the revenue side, there was a significant decline in customs revenue due to the reduction in imports. To address the situation, three extraordinary taxes were introduced: an additional tax on labor income, a tax on exceptional war profits, and a tax on tungsten exports. Between 1939 and 1944, the stock of public debt in circulation increased by 30%, with most of the bonds bought by the banking system.

Finally, regarding economic policy, following the Economic Reconstitution Law of 1935 and its ambitious public investment plan, three important complementary laws were published between 1943 and 1945: the law on capital nationalization, requiring that 60% of the capital of firms promoting projects of fundamental interest be Portuguese-owned, the electrification law, and the industrial development law. Among the announced projects were the Castelo de Bode dam, the construction of over 8,000 schools (*Plano dos Centenários*), and the building of over 40,000 kilometers of roads, tripling the national road network. However, war constraints led to the postponement of most of these investments until after the conflict. They played an important role in the surge of public investment that, in 1945, contributed to preventing a recession in Portugal following the end of the war.

2. THE THREE SOURCES OF SHOCKS TO THE ECONOMY

Supply restrictions

In the context of a wartime economy between 1939 and 1945, there were significant obstacles to importing consumer and investment goods that were essential for the Portuguese economy. Importing imports was especially challenging, and maritime transport was interrupted, affecting all supply chains. The import of certain raw materials that were scarce in international markets and whose prices skyrocketed became subject to prior government authorization, while imports of automobiles and luxury items were officially suspended. Simultaneously, measures were put in place to restrict the exportation of essential goods such as tin, tar, certain chemicals, butter, or cheese.

The scarcity of goods led to a policy of rationing that affected the country's living conditions. Rationing of fuels was particularly noticeable; for example, starting from the summer of 1941, the circulation and supply of automobiles were prohibited for three days a week. In trade, codfish, olive oil, soap, oil, and sugar were examples of

products subject to rationing, which was imposed through a quarterly coupon system. Simultaneously, the prices of milk, codfish, and other essential products were administratively controlled. In urban areas, authorities allowed again the rearing of poultry and rabbits in backyards, balconies, and courtyards.

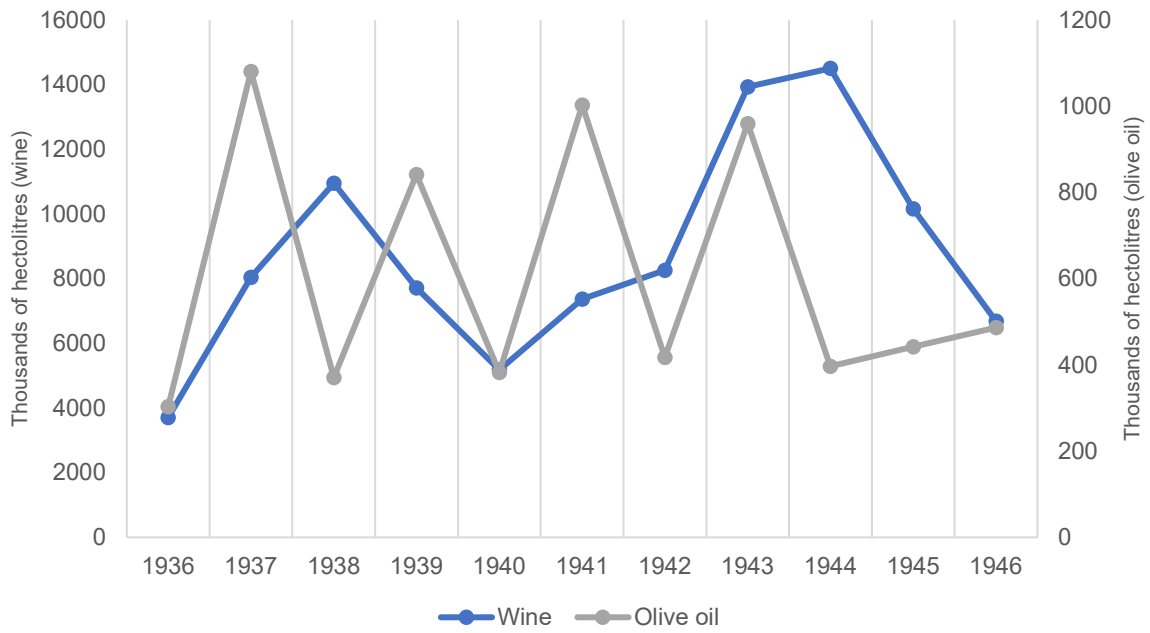
Rationing intensified as the conflict prolonged. Starting from March 1942, electricity and gas were rationed throughout the country. In Lisbon, coal consumption was restricted during the cold winter of 1944-45. In the final months of the conflict, a quarter of the locomotives of railway companies were out of service due to fuel shortages. Additionally, between late 1942 and early 1943, there were records of strikes in public transportation and industrial areas in Lisbon and Almada-Barreiro, as well as in the industrial centers of S. João da Madeira and Silves. With the end of the conflict, rationing measures were gradually lifted in the following months. By November 1945, the press of the time already reported normal fuel availability and significant price reductions at gas stations.

Weather and poor harvests: 1940, 1942 and 1944-45

During this period, the agricultural sector accounted for 33% of GDP and employed 53% of the workforce. In 1940, an off-year in olive production coincided with a poor viticultural year due to late rains and some pests. As shown in [Figure 1](#), olive oil production decreased by 54% compared to the previous year, and wine production fell by 32%.

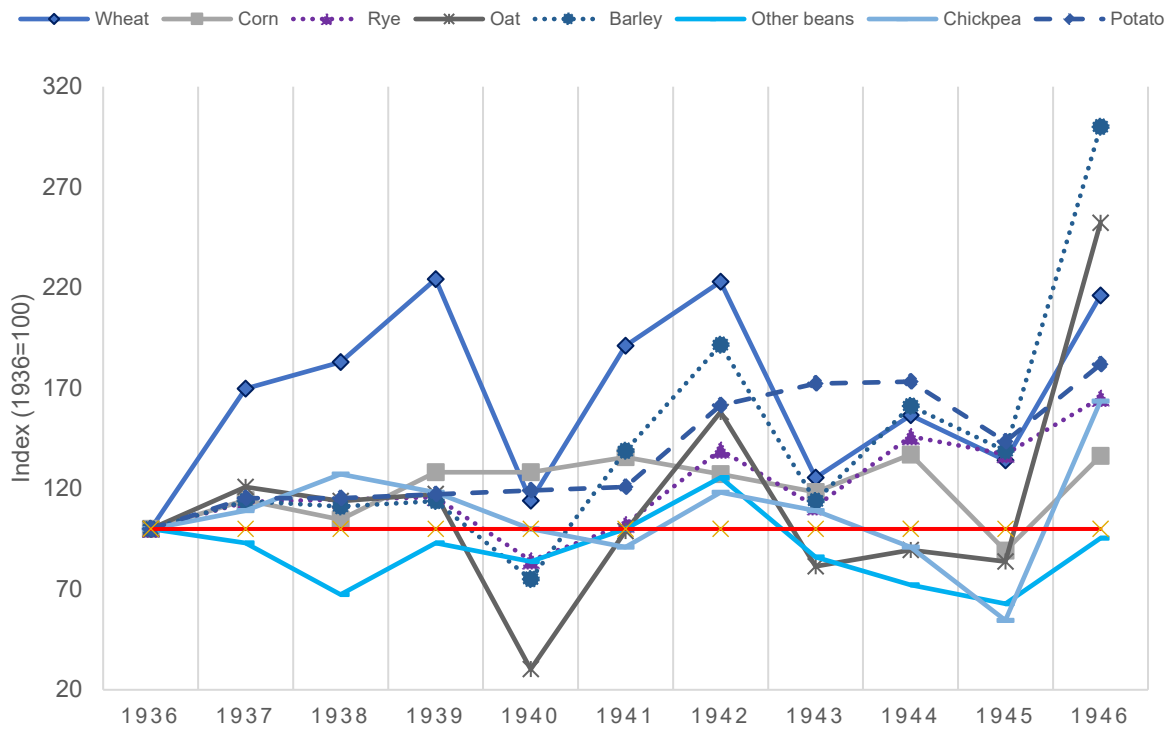
The cereal campaigns of 1940 were also unfavorable, associated with late rains that damaged the crops. As revealed in [Figure 2](#), the wheat harvest in 1940 fell by 50% compared to the previous year and by over 60% compared to the historical harvest of 1934. The agricultural policy response was an increase in subsidies for wheat production and the facilitation of credit lines for the mechanization of the production process in the subsequent campaign. In 1940, oat, rye, and broad bean production also experienced declines of 74%, 25%, and 50%, respectively. Cereal production remained volatile in the following years, with a recovery until 1942, followed by a decline until 1945. However, there was no growth trend for any crop, which may be explained by the lack of imported fertilizers and higher quality seeds (which had been introduced in the previous decade).

Fig. 1 - WINE AND OLIVE OIL CYCLES



Source: Valério (2001).

Fig. 2 - AGRICULTURAL HARVESTS



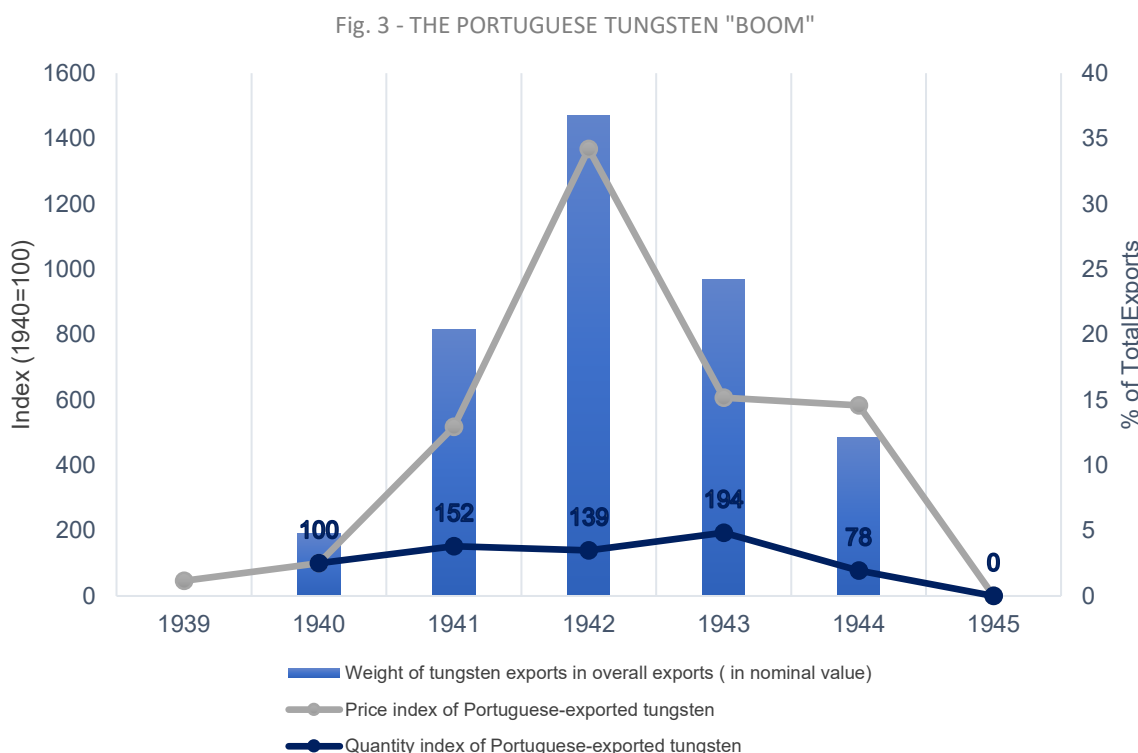
Source: Valério (2001).

In terms of weather, the winter of 1941 was marked by severe storms, most notably the cyclone on February 15, 1941, which caused hundreds of deaths and injuries throughout the country, particularly in the Tagus Valley. Violent gusts and floods destroyed homes, forests, and crops across the country, with reports of damage in Ribatejo, Coimbra, Minho, and the Algarve. Several vessels were also lost along the coastline.

Wine production stagnated between 1941 and 1942, although there were significant regional variations. In addition to natural factors, there were difficulties in importing pesticides and fungicides. Olive oil production, which was one of the most important harvests, dropped by 58% in 1942 compared to 1941. Although olive oil exports had been restricted since the beginning of the war, the authorities purchased the entire national stock of olive oil at a fixed price in the last quarter of 1942, seeking to ensure its regular supply. In cereals, rice and maize production decreased by 12% and 6%, respectively, but wheat production reached its highest level since the peak of 1939 in 1942.

Exports and the Portuguese tungsten boom: 1941-44

Between 1941 and 1944, there was an historic boom of Portuguese, depicted in **Figure 3**. In January 1942, the first official supply contract was signed with Germany, stipulating the supply of 2,800 tons per year. The trade agreement with the Allies in September 1942 provided for a volume of 4,000 tons per year. Both agreements were revised successively during the conflict.

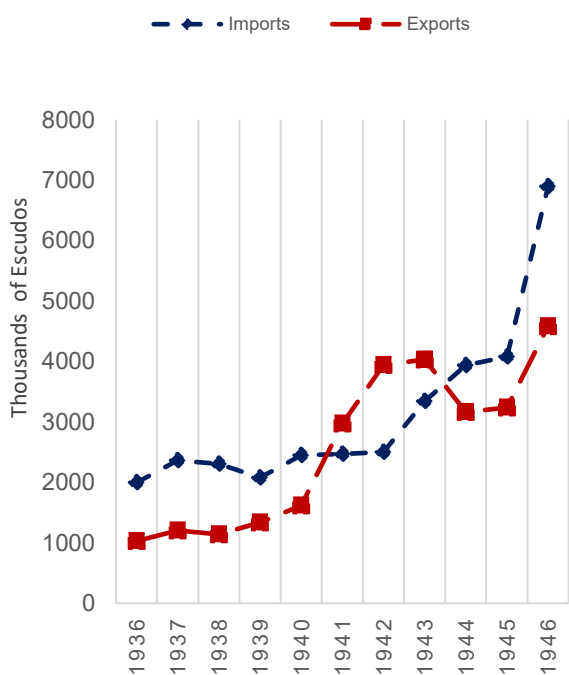


Source: Nunes (2010).
Note: only official exports of tungsten.

The tungsten ore, which was previously of little significance in national exports, was sold in 1942 at an average price that was 32 times higher than in 1938 (Banco de Portugal). In 1940, there were 324 mines where tungsten could be extracted, a number that reached 746 in 1944 (Institute of Mines). Between 1939 and 1944, Portugal accounted for 10.5% of the total volume of tungsten traded globally, being by far the largest producer in continental Europe (Nunes, 2010). In terms of quantity, the approximately 3,400 tons exported in 1940 grew to nearly 6,700 tons in 1942. This was the peak of the tungsten boom, with the mineral representing almost 40% of national exports in value (Nunes, 2010). State control was strong, particularly in foreign trade, where significant export duties per kilogram were established, and crackdowns of black-market activity were enforced.

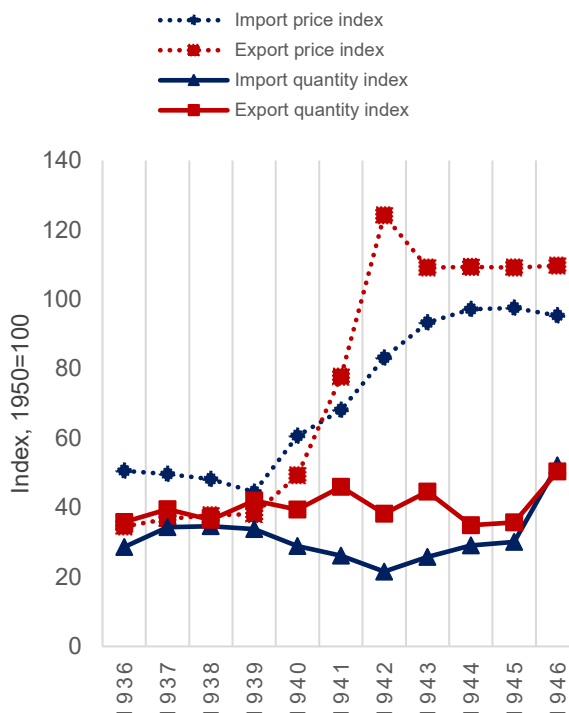
The period from 1941-1943 constituted a historical exception in Portuguese foreign trade due to the surplus in the balance of trade and Portugal's role as a creditor to the United Kingdom (Figure 4). Without tungsten, the Portuguese trade balance would likely have seen its negative balance worsen. Private consumption may also have benefited from the income generated from the sale of tungsten, whether legal or clandestine. The decision to interrupt the legal trade of this mineral in June 1944 resulted in a significant contraction of the trade balance, which returned to chronic deficits in 1945, imposing a sharp decline in the national economic dynamics during the war. Because illegal tungsten trade continued, the declines in the trade balance and production were probably not as significant as indicated in official statistics.

Fig. 4 - FOREIGN TRADE - NOMINAL VALUE



Source: Valério (2001).

Fig. 5 - FOREIGN TRADE- INDEX



Source: Lains (2003).

In terms of quantities, Portuguese foreign trade contracted during the period 1939-1945 in general (**Figure 5**). Individual prices were highly volatile. In terms of imports, in 1942, gasoline imported by Portugal had increased by 206% compared to 1938, agricultural fertilizers had become 80% more expensive, and cotton had increased by 96% (during the same period). On the export side, between 1938 and 1942, cork prices increased by 110% to 205%, wines by 78%, and canned fish by 50% to 80% (Banco de Portugal, 1942). However, without maritime transportation, two of Portugal's main exports, cork and Port wine, faced difficulties in finding markets, reducing their contribution to the trade balance.

3. CALIBRATION OF PEAKS AND TROUGHS

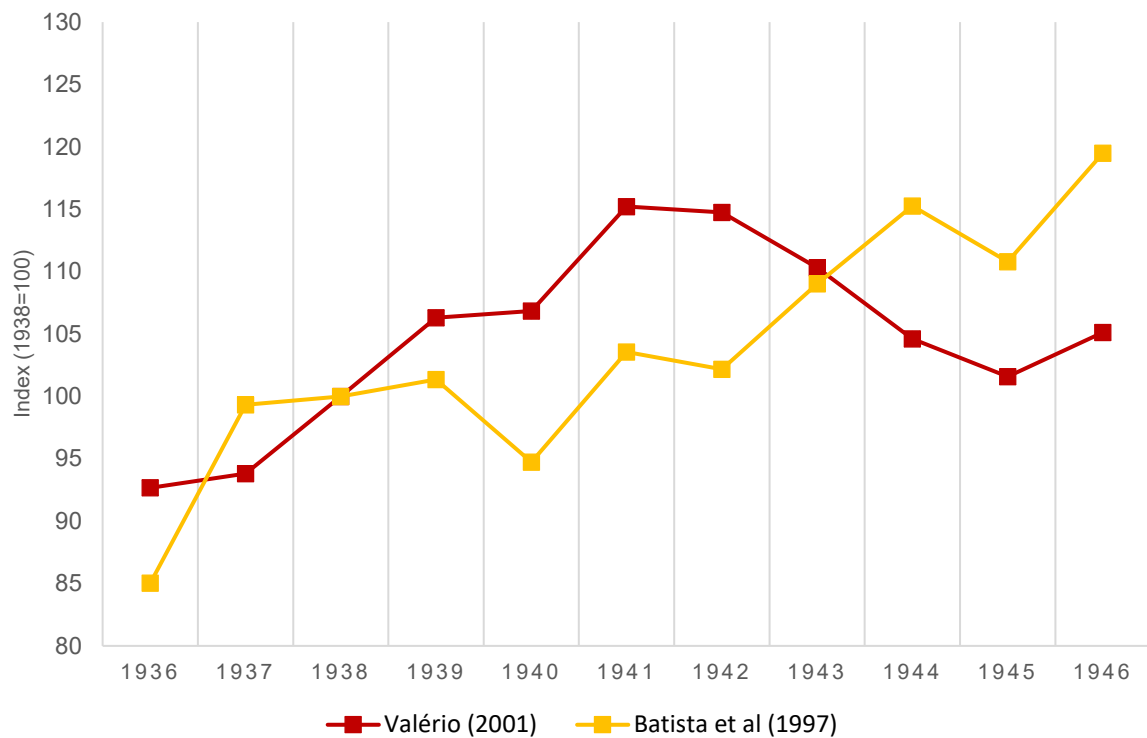
The business cycle during this period has unique characteristics with parallels only during the First World War. This is a result of the consequences of a wartime period, with its limitations on international trade, volatility in commodity prices, rationing, as well as several poor agricultural years and the exceptional boom in tungsten exports.

The beginning of external restrictions and rationing coincided with a poor agricultural year in 1939-40, making 1940 a trough year. GDP fell by 6% that year, according to one series, and it halted a high growth rate in the previous two years, according to the other (**Figure 6**). Almost all the decline came from the agricultural sector, confirming the agricultural origin of this recession (**Figure 7**). In turn, the breakdown by expenditure shows that the major portion of this recession lies in consumption, consistent with rationing (**Figure 8**). In 1941, the start of the tungsten boom and the recovery of harvests contributed to a quick end to this recession.

Although economic activity slowed down in 1942, there was not enough co-movement among the main sectors, or within the agricultural sector, to confirm a recession. Only rice and corn, among the cereals, seemed to suffer significant declines, which coincided with a year of lower olive production. On the other hand, the important crops of wheat, oats, and rye saw increases in production. Wine production, which had a significant impact on the economy at the time, increased slightly. The exceptionally high external trade surplus, led by tungsten, played a decisive role in preventing a recession in Portugal in 1942.

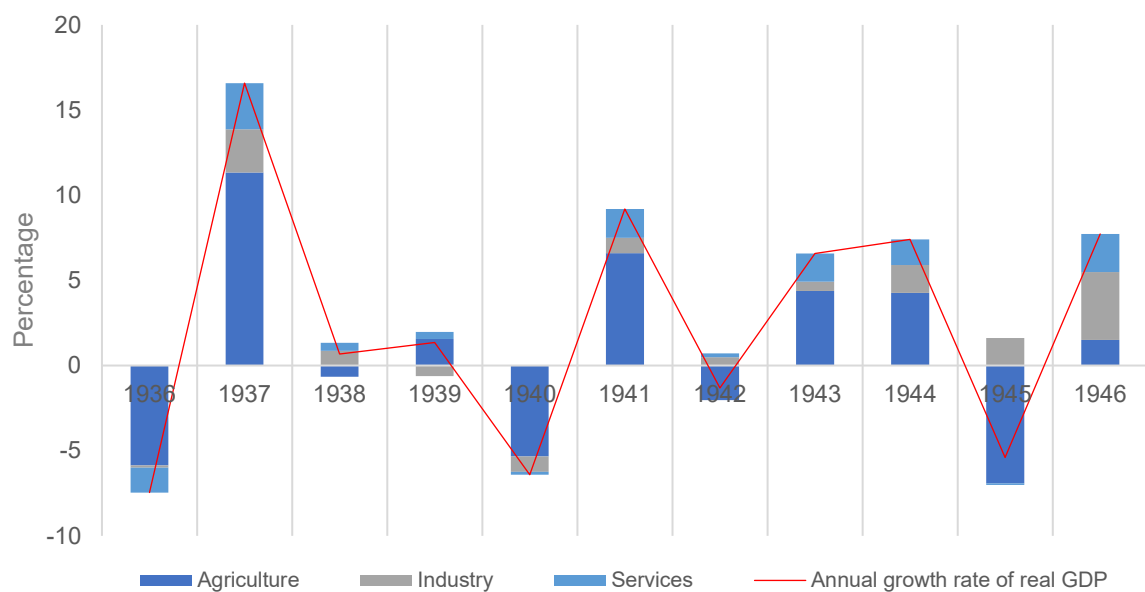
However, the armistice in continental Europe in 1945 led to a new (short) recession in Portugal, with a trough in 1945. The end of tungsten exports that was imposed in 1944, due to external political pressure, terminated an important source of revenue for the country. Additionally, between the fall of 1943 and the spring of 1946, the longest drought on record occurred. Crops that were more dependent on irrigation, such as beans or corn, reached decade-low yields in the 1945 harvest.

Fig. 6 - AGGREGATE GDP ACCORDING TO TWO SERIES



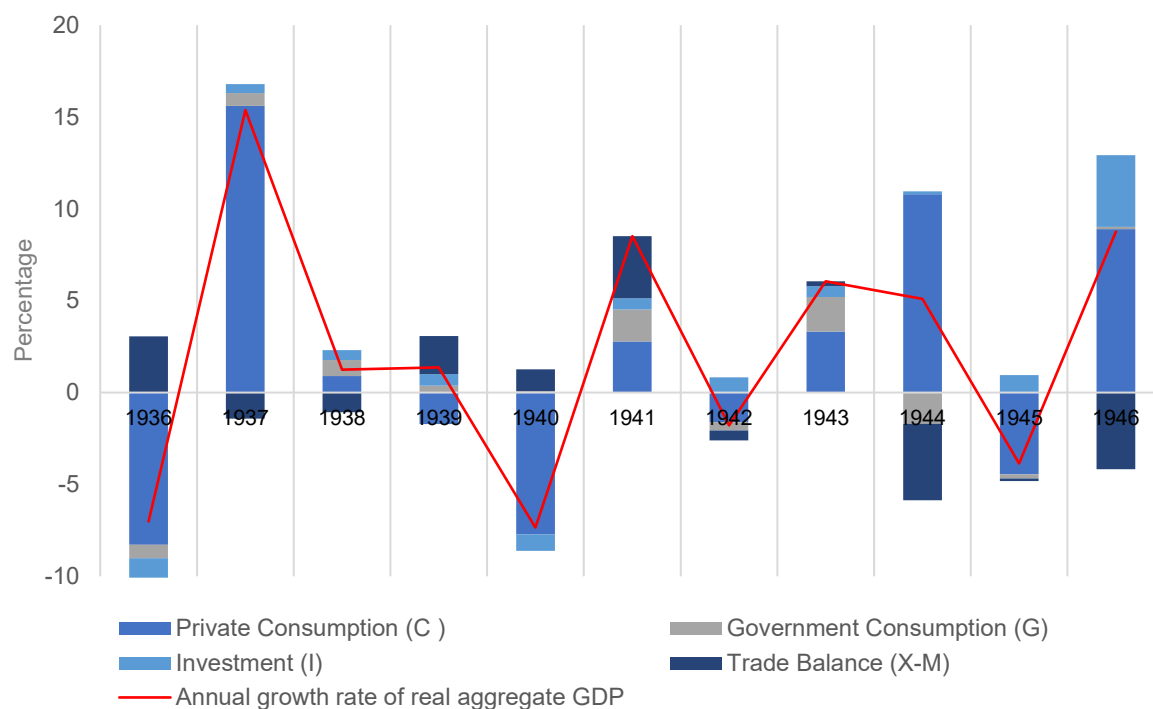
Sources: Batista et al. (1997): nominal GDP in Batista et al. (1997). Valério (2001): nominal GDP in Valério (2001), retrieved from Valério (1998). The implicit deflator of the respective source is applied to each series.

Fig. 7 - COMPOSITION OF GDP CHANGES (SECTORS)



Source: Lains (2003), based on em Batista et al (1997)..

Fig. 8 - COMPOSITION OF REAL AGGREGATE GDP (EXPENDITURE APPROACH)



Source: Batista et al (1997).

In both series, GDP declined in 1945 (Figure 6). Naturally, most of the GDP reduction was concentrated in the agriculture sector (Figure 7). The production across different sectors was still unsynchronized, reflecting the nascent industrialization of the country, which did not yet have sufficiently established market mechanisms to facilitate inter-industry co-movement. However, the decline in the extractive industry was offset by the expansion of manufacturing industries, so the overall industrial output positively contributed to GDP growth between 1941 and 1946. The Committee highlights that the recession was not deeper because investment quickly recovered, partly through public investment in various projects (under the Economic Reconstruction Law) that had been postponed but were relaunched in 1945, and their contribution can be seen in Figure 8.

Similar to what happened during the First World War, the price level increased significantly, doubling during the conflict and thus following inflation in the US. However, keeping the dollar peg and the efforts in monetary and fiscal policy allowed inflation to stabilize immediately in 1945. Therefore, the nominal anchor in Portugal remained strong, contributing to the recession of 1944-45 not being prolonged, unlike what happened after the First World War, and even allowing for an economic expansion that would continue until 1951.

4. CONCLUSION

The Portuguese business cycle during World War II was simultaneously affected by the traditional factors related to the agricultural cycle, whose volatility typically dominated the business cycle, as well as by the vicissitudes of the wartime economy. Throughout the entire period, the strong contraction of foreign trade and the resulting shortage of essential products and materials, along with the rationing of many consumer goods, led to a difficult period for the population.

In 1939, the beginning of hostilities coincided with poor harvests in 1940, causing the economy to enter a recession. Between 1940 and 1944, there was an expansion of production, with a decisive contribution from the trade balance surplus, driven by tungsten exports and the widespread increase in prices of exported goods. Agriculture also experienced good harvests, especially in 1941 and 1943. However, this expansion was not widespread across all sectors and it did not lead to a clear improvement in living conditions, as it was constrained by limitations on the market economy (rationing, industrial control, capital controls) and the country's limited industrialization.

However, starting in the autumn of 1943, most of the continental territory experienced a drought that worsened some harvests in 1944 and caused a more widespread and deep decline in 1945. In that year, Portugal no longer exported tungsten, leading to a new recession. At the same time, the boost from public investment in 1945 contributed to a short recession, with a trough already in 1945.

REFERENCES CITED IN THE TEXT

(For a comprehensive list of the sources, see methodological note)

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